IN THE SPECIFICATION

Please amend the paragraph beginning at page 2, line 20 as follows:

Caloric test. The caloric test artificially stimulates the inner ear vestibular receptors using either ~~war-water~~ warm-water or cold-water irrigations of the external ear canals. This evokes eye movements, which are measured and compared across ears to determine vestibular asymmetry. Patients are placed in a supine position with the head elevated about 30° in a darkened room. This head position places one set of vestibular receptors, the horizontal semicircular canals, into an earth-vertical orientation. An irrigation creates a thermal gradient across the inner ear that stimulates the horizontal canal, primarily by inducing a convective fluid movement within the distal loop of the canal, and secondarily, by direct thermal effects. This fluid movement stimulates receptor hair cells, which in turn modulate the activity of the 8th nerve afferents that innervate the horizontal canal. A warm water irrigation results in an increased afferent discharge rate, and a cold water irrigation causes a decreased discharge rate. The increased discharge caused by warm irrigations evokes a sensation of sustained rotation toward the irrigated ear and evokes a compensatory VOR eye rotation away from the irrigated ear. Cold water irrigations evoke oppositely directed sensations and compensatory eye movements.

Please amend the paragraph beginning at page 18, line 30 as follows:

Figure 1 depicts a block diagram of an embodiment for a system 100 having a device 110 to rotate a subject to be tested and a motion control 120 to control the motion of the device 110. In this embodiment, stimuli are provided to device 110 to turn off vestibular responses in one ear of the subject, while allowing vestibular responses in the other ear to be evaluated. In an embodiment, device 110 is a clinical rotation chair. In an embodiment, device 110 and motion control 120 are integrated. In an embodiment, system 100 is a clinical rotation chair. In an embodiment, rotation of device is about an earth-vertical axis with a subject's head oriented 20° nose down from Reid's plane to place the horizontal canal plane perpendicular to the axis of rotation. Medical centers and clinics that specialize in diagnosing balance disorders usually have conventional clinical rotation chair systems. Several medical equipment companies ~~manufacturer~~ manufacture these systems. Embodiments for the rotation test and analysis may be

incorporated into these existing systems by modifying the software that controls the movement of the chair in which the patient, subject, is seated and analyzes the evoked eye movements. In most cases, modifications to the existing rotation chair equipment (motors, eye movement recording equipment) would be minimal. In an embodiment, the novel rotation test and analysis may be incorporated into the clinical rotation chair systems at the time of manufacture, at a nominal cost, since the expense would not involve any new equipment but rather the novel programming of the rotation chair systems to include the new stimulus and analysis.

Please amend the paragraph beginning at page 29, line 3 as follows:

Three normal and four unilateral loss subjects were tested using 2-sine stimuli identical to those used in the simulation study described above with respect to Figures 6A-6F and Figures 7A-7F ~~7A-6F~~. The unilateral loss subjects included subject UL1, a 66 year old female who had a left side acoustic neuroma removed by a trans-labyrinthine surgical approach 3 years prior to testing, subject UL2, a 46 year old male with a 3 cm left side acoustic neuroma treated with a "gamma knife" radiation procedure 3 1/2 years prior to testing, subject UL3, a 27 year old male with right side absent vestibular function, as determined by caloric testing (Meningitis contracted during infancy is believed to be the cause of this right side loss), and subject UL4, a 47 year old female with a right labyrinthectomy performed 3 months prior to testing as treatment for Meniere's disease.

Please amend the paragraph beginning at page 29, line 3 as follows:

Figures 9A-9F show the modulation of the VOR response to the probe component with the VOR slow phase velocity data filtered using a 0.5 to 5 Hz bandpass filter. Experimental VOR probe responses to 2-sine stimuli with the bias component amplitude increasing from 0 to 250 °/s. Results are shown for the two subjects with a left unilateral loss (UL1 & UL2), the two with a right unilateral loss (UL3 & UL4), and the one normal subject (N1) of Figures 8A-8F. VOR modulation of the probe response is diminished during rotations towards the dysfunctional ear. The unilateral loss subjects showed a systematic modulation of the VOR probe component amplitude over the 10 s bias component cycle. This modulation increased with increasing bias component amplitude. In contrast, the normal subject did not show a systematic increase in

probe component modulation with increasing bias component amplitude. Additionally, the normal subject did not show the "double modulation" evident in the simulated VOR responses at the 200 and 250°/s bias component velocities, indicating that the simple model in ~~Fig. 2~~ Fig. 5 does not fully capture actual VOR behavior. All 3 normal subjects tested had results similar to those shown in Figures 9A-9F.

Please amend the paragraph beginning at page 31, line 5 as follows:

Figure 10A depicts a block diagram of an embodiment for analysis of a probe component. The flow diagram for the embodiment of the method shown in Figure 10A is used to characterize the response to the probe component portion of the VOR. Example data in Figure 10B are from subject UL1 of Figures 9A-9F, with a left side unilateral loss, tested with a 200°/s bias component amplitude. The analysis includes both standard methodology, typically applied to VOR analysis, and novel methodology used to separate and analyze the probe response. A video analysis is performed, at 1010, to acquire pupil center coordinates (x_c, y_c) and a calibration is applied, at 1020, to provide a horizontal eye position and a vertical eye position as a function of the pupil center coordinates (x_c, y_c). The standard portion of the analysis includes calculation of eye velocity from eye position data, at 1030, and separation of the slow and fast phases of nystagmus in order to obtain slow phase eye velocity, at 1040. The novel aspects of the analysis include bandpass filtering to isolate the response to the probe component of the stimulus, at 1050, and parameterization of the probe response, at 1070. As shown in Figure 10A, after filtering, at 1050, the filtered signal may be averaged, at 1060, such as averaging over five 0.1 Hz cycles. In an embodiment, the parameterization of the probe response uses a curve fit. In an embodiment, the curve fit, the probe response fit, to the filtered and averaged VOR data uses the following equation:

$$\left\langle \hat{\theta}_{bp} \right\rangle = A_p\left(1 + m\cos\left(\omega_b t + \varphi_b\right)\right)\cos\left(\omega_p t + \varphi_p\right) \qquad \text{(eqn. 1a)}$$

$$\left\langle \hat{\theta}_{bp} \right\rangle = A_p\left(1 + M(t)\right)\cos\left(\omega_p t + \varphi_p\right) \qquad \text{(eqn. 1b)}$$

In an embodiment, the bandpass response is filtered over a number of cycles of the bias component. In an embodiment, the bandpass response is filtered over five 0.1 Hz cycles.